

Vortex shedding behind an obstacle in a channel under transition to turbulence in steady and pulsating flows

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Abstract

© Published under licence by IOP Publishing Ltd. Experimental research and DNS of separated flow over a spanwise semicylindrical rib mounted in a rectangular channel have been performed for the cases of steady and pulsating flow with transition to turbulence. Spiral motion of fluid behind the rib directed from the channel walls towards the channel symmetry plane has been shown to govern the formation of large vortices in the mixing layer starting from some critical Reynolds number. The mechanism of origination of such motion has been hypothesized. The effect of frequency and amplitude of forced freestream pulsations on the vortex pattern behind the rib has been described.

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